CASE REPORT

Right upper quadrant abdominal pain as the initial presentation of polyarteritis nodosa

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Accepted 9 February 2017

SUMMARY

Polyarteritis nodosa (PAN) is a necrotising vasculitis that involves medium and small vessels. PAN generally presents with constitutional, cutaneous, neurological, renal and gastrointestinal manifestations. However, PAN initially involving a single organ/system is uncommon. Here, we present a 42-year-old man who was hospitalised because of severe right upper quadrant abdominal pain that started 2 months before. Physical examination was remarkable for right upper quadrant abdominal tenderness. Abdominopelvic CT showed lymphadenopathy but no hepatic, gallbladder, pancreatic, intestinal or renal abnormalities. Abdominal angiography showed multiple small aneurysms located in the jejunal and hepatic arteries characteristic of PAN. He had a prompt and remarkable response to high-dose corticosteroids and oral cyclophosphamide. Our case, together with other reports, suggests that PAN should be considered in patients presenting with right upper quadrant abdominal pain. Timely diagnosis and treatment reduce the overall morbidity and mortality of the disease.

BACKGROUND

Polyarteritis nodosa (PAN) is a necrotising vasculitis that involves medium and small vessels which may affect multiple organs and systems.¹ It is a rare condition that usually is diagnosed between 40 and 60 years of age.^{2–3} Men are slightly more affected than woman.^{2–3} PAN generally presents with fever, general malaise, weight loss, skin lesions, mononeuritis multiplex, renal disease and gastrointestinal (GI) involvement, among other manifestations.^{4–5} However, on rare occasions it may affect or initially present in a single organ or system. Single organ PAN has been reported in cutaneous, testicular, neurological, cardiac and GI organ/systems.^{6–11} Owing to the wide spectrum of clinical presentations and being PAN a rare illness diagnosis and treatment are often delayed. Here, we present a middle-aged man with PAN who initially presented with severe right upper quadrant abdominal pain secondary to vasculitis of jejunal and hepatic arteries. He had no other clinical manifestations of systemic vasculitis.

CASE PRESENTATION

A previously healthy 42-year-old Puerto Rican man was hospitalised to the internal medicine unit because of a severe right upper quadrant abdominal pain that started 2 months prior to admission. Pain was described as stabbing, persistent and non-radiating which worsen after meals. It was associated with nausea and vomiting. Initially,

abdominal pain was generalised and mild but gradually evolved into a severe pain that was more prominent in the right upper quadrant. Prior to admission, he visited emergency departments on repeated occasions and had short hospital stays. He was treated with multiple analgesics and intravenous antibiotics but these were ineffective. In addition to abdominal symptoms, he had tiredness, weight loss of 30 pounds and intermittent watery diarrhoea. Otherwise, the review of systems was unremarkable. He had no history of illicit drug use or recent travel and described himself as being a healthy athlete who practiced long-distance cycling and running. Family history was unremarkable for any GI disease, malignancy or autoimmune connective tissue diseases.

On physical examination, vital signs were within normal range (temperature 36.0°C, heart rate 75 bpm, blood pressure 121/59 mm Hg and respiratory rate 18 respirations per minute). He had generalised abdominal discomfort to palpation, but more pronounced in the right upper quadrant. He had no rebound tenderness or palpable organomegaly. Bowel sounds were normal and Murphy's sign was negative. He had mild muscle wasting of lower extremities. No rashes were seen. The rest of the physical examination was unremarkable.

INVESTIGATIONS

Laboratory tests showed a white cell count of 4700/μL, haemoglobin of 11.6 g/dL and platelet count of 487 000/μL. He had marked elevation of Westergren sedimentation rate at 98 mm/hour and C reactive protein at 122.4 mg/dL. Serum electrolytes, blood urea nitrogen and creatinine levels were normal. Alkaline phosphatase was elevated at 497 U/L (normal range 40–129 U/L) but aspartate aminotransferase, alanine aminotransferase, total bilirubin, amylase and lipase levels were normal. Urine analysis was normal; no proteinuria, haematuria or urinary casts were observed. Blood cultures were negative. HIV, hepatitis C and B tests were negative. Stools for *Clostridium difficile* toxins A and B were negative.

Immunological tests showed elevated perinuclear antineutrophil cytoplasmic antibodies (p-ANCA) at 1:640 titre, but negative cytoplasmic antineutrophil cytoplasmic antibodies, antimyeloperoxidase antibodies and antiproteinase-3 antibodies. Also, he had elevated antinuclear antibodies (ANA) with a titre >1:320 (homogeneous pattern) and anti-Ro antibodies >100.0 EU/mL (normal <16.0 EU/mL). Antidouble-stranded (dsDNA), anti-Smith, anti-ribonucleoprotein, anti-La, anticardiolipin and anti-β₂-glycoprotein I antibodies were negative. Serum

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To cite: Gago R, Shum LM, Vilá LM. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2016-218019

complements C3 and C4 were normal, lupus anticoagulant test was negative, and cryoglobulin levels and rheumatoid factor were not elevated.

Abdominal and pelvic CT with intravenous contrast showed numerous enlarged lymph nodes in the abdominal and pelvic cavities. No hepatic, gallbladder, pancreatic, intestinal or renal abnormalities were observed. Chest CT with intravenous contrast revealed a small left pleural effusion and bilateral axillary lymphadenopathy. Right inguinal node biopsy showed reactive hyperplasia and negative markers for lymphoproliferative malignancies. An ultrasound scan of the scrotum showed normal anatomical contour of testicles and epididymis without any masses or abnormalities. Since he persisted with severe abdominal pain that suggested an ischaemic aetiology an abdominal angiography was ordered. This study showed multiple small aneurysms and arterial calibre changes located in the jejunal and hepatic arteries characteristic of PAN (figure 1A, B).

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of right upper quadrant abdominal pain is broad including liver and gallbladder disorders, diverticular disease, inflammatory bowel disease, pancreatic disorders, pyelonephritis, nephrolithiasis, pulmonary disorders and malignancy. Extensive work-up including laboratory tests and imaging studies performed in our patient discarded these possibilities. The diagnosis of PAN in our patient was made by angiography. According to Hekali *et al*¹² the angiographic diagnosis of PAN has a sensitivity of 89% and a specificity of 90%, being aneurysms the most common finding. As in our case, when only mesenteric or hepatic arteries are involved tissue biopsy confers a high risk for bleeding and other complications; therefore, angiography turns into a vital tool for diagnosis.

TREATMENT

The patient was started on high-dose corticosteroids (intravenous methylprednisolone 1 mg/kg/day) and cyclophosphamide 150 mg orally daily. Abdominal pain resolved after 3 days of therapy. He was able to tolerate food without having abdominal pain, nausea or vomiting. After 5 days, methylprednisolone was switched to oral prednisone 60 mg daily and he was discharged home. Prednisone 60 mg daily was continued for 4 weeks then it was decreased as follows: 50 mg daily for 4 weeks, 40 mg daily for 4 weeks, then decreased by 10 mg every 2 weeks until reaching 20 mg daily and then decreased by 2.5 mg every 2 weeks until a dose of 10 mg daily was reached. Cyclophosphamide was increased to 200 mg orally daily (2 mg/kg/day) and clopidogrel was started for prevention of thrombotic events. Also, *Pneumocystis jiroveci* pneumonia prophylaxis with atovaquone 1500 mg orally daily was prescribed in view that he was allergic to sulfonamides.

OUTCOME AND FOLLOW-UP

After 8 months of follow-up the patient has remained asymptomatic. He regained weight and restarted routine exercises. Follow-up abdominopelvic CT did not show lymphadenopathy or other abnormalities. Westergren sedimentation rate and C reactive protein levels decreased to normal range. He had no flares. On previous evaluation, he was taking cyclophosphamide 200 mg orally daily and prednisone 10 mg daily.

DISCUSSION

We describe a middle-aged man with an atypical presentation of PAN manifested by severe right upper abdominal pain in the

Figure 1 Superior mesenteric arteriogram (SMA) shows microaneurysms and arterial calibre changes at (A) distal jejunal branches and (B) right hepatic artery. In this patient the right hepatic artery arises from the superior mesenteric artery rather than the celiac artery.

absence of other organ involvement of systemic vasculitis. The intestinal angiographic findings were consistent with PAN and the remarkable response to corticosteroids and cyclophosphamide treatment further supports this diagnosis.

Our patient presented with various autoantibodies which are not typically seen in PAN such as p-ANCA, ANA and anti-Ro antibodies. The presence of these antibodies may argue against PAN and in favour of ANCA-associated vasculitides (eg, granulomatosis with polyangiitis, microscopic polyangiitis and eosinophilic granulomatosis with polyangiitis) or vasculitis secondary to autoimmune connective tissue diseases (eg, systemic lupus erythematosus, Sjögren's syndrome and mixed connective tissue disease). However, positivity to these autoantibodies has been described before in PAN.^{2 5 13–15} Also, our patient did not present with clinical manifestations suggestive of these vasculitic syndromes such as asthma, sinusitis, upper or lower airway involvement, glomerulonephritis, arthritis, cutaneous lesions, or

sicca symptoms. Similarly, other serological testing for autoimmune connective tissue diseases including serum complements, rheumatoid factor and anti-dsDNA, anti-Smith, anti-RNP, anti-La and antiphospholipid antibodies were negative.

As observed in our case, involvement of medium and small vessels located in superior mesenteric and hepatic arterial territories are commonly seen in PAN.^{16 17} Arterial calibre changes, corkscrew vessels and distal microaneurysms are usually seen on angiography.^{12 17} The superior mesenteric artery rather than the inferior artery is the one most commonly affected in PAN.^{12 16 17} Those distributed to the jejunum are the most commonly involved followed by those to the ileum. On the other hand, the hepatic vasculature may be affected in up to 53% of patients with PAN.¹⁶ The latter may compromise arteries of the bile ducts, gallbladder and liver, consequently causing acalculus cholecystitis, gallbladder infarcts, aneurysms, intrahepatic haematomas and infarcts.^{4 11 17}

PAN commonly presents with abdominal pain and more than half of those will develop into acute abdomen pain if not treated promptly.^{16 17} For example, Levin *et al*¹⁷ reported that out of 24 patients with PAN having GI involvement, 13 (54%) developed acute abdomen pain with a 23% mortality. In terms of the location of abdominal pain, right upper quadrant pain has been reported as the initial presentation of PAN in numerous reports.^{4 11 16 18–20} In contrast to our patient, most cases were diagnosed after cholecystectomy for acalculous cholecystitis in which tissue analysis disclosed PAN.^{11 18 19} Gallbladder involvement can cause right upper quadrant pain and also hepatic aneurysm rupture.^{20 21}

Death occurring during the first year after diagnosis of PAN is usually associated with vasculitic complications, most commonly when having GI involvement, instead of iatrogenic complications (eg, immunosuppression, sepsis).²⁰ In our patient, immunosuppressive treatment was started after 2 months of onset of symptoms. Fortunately, he did not present with life-threatening complications such as ruptured hepatic aneurysm or bowel infarct or rupture. Early treatment with immunosuppressive drugs have demonstrated to reduce the possibility of aneurysm formation, decrease the number of associated comorbidities and reduce mortality rates when compared with delayed treatment.^{3–9 16–18}

In summary, the differential diagnosis of right upper abdominal pain is ample but usually does not include PAN. Our case, together with other reports, suggests that PAN should be considered in patients presenting with right upper abdominal pain particularly in those with intractable pain despite antibiotics and

analgesic therapy. Prompt treatment has shown to prevent the progression of the inflammatory vasculopathy, consequently reducing the possibility of aneurysm formation and the likelihood of rupture, as well as the overall morbidity and mortality of the disease.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- ▶ Polyarteritis nodosa (PAN) is a necrotising vasculitis that involves medium and small vessels which may affect multiple organs and systems.
- ▶ On rare occasions PAN may affect or initially present in a single organ or system, including the gastrointestinal system.
- ▶ Our case, together with other reports, suggests that PAN should be considered in patients presenting with right upper abdominal pain particularly in those with intractable pain.
- ▶ Prompt diagnosis and treatment reduce the overall morbidity and mortality of PAN patients initially presenting with gastrointestinal involvement.

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